PROJECT NUMBER: 1752
PROJECT TITLE: Optical Spectroscopy of Tobacco and Smoke
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PERIOD COVERED: October, 1985

## I. Smoke Measurement by Tuneable Diode Laser

### A. Water in Sidestream Smoke

The TDL system was used to measure the amount of water generated in the sidestream of three different types of cigarettes: one cigarette had an MgO treated paper, the second contained $CaCO_3$ in the paper to match the porosity of the MgO paper and the third cigarette used a standard Marlboro paper. The amount of gaseous water in the whole sidestream smoke delivered by these three cigarettes was not statistically different based on a one way analysis of variance. Plans are being considered, when time permits, to determine the total water in sidestream (i.e. vapor phase and particulate phase).

### B. Formaldehyde in Mainstream Smoke

A TDL based analysis is in the process of being developed for the quantitative measurement of formaldehyde in mainstream cigarette smoke. Currently, the smoking system and transfer lines to the TDL white cell are being redesigned for this analysis.

## II. Nicolet GC/FT-IR System

Performance evaluations to determine the detection limits of the "light pipe" interface as a function of molecular structure are nearing completion. The results show that the detection limits for most compounds eluting from a capillary column are on the order of 200ng per component. This is based on the ability of the search software to correctly identify the unknown in the top five best hits. Compounds which are strongly absorbing in the infrared such as low molecular weight esters may be detected in concentrations below 50ng. Weak infrared absorbers such as aliphatics may require 400 to 500ng for identification. Efforts are currently underway with Nicolet to obtain their new micro version "light-pipe" on a one for one trade basis. This new GC "light pipe" interface should enhance detection by two fold over our existing accessory.

## III. Infrared Analysis of "Smokeless Cigarette"

Samples of a plastic, smokeless and non-lightable cigarette were analyzed by infrared spectroscopic techniques at the request of the Cigarette Testing Division. The results indicated that the plastic tube which resembles the rod portion of a cigarette is constructed using poly (ethylene terephthalate). The material which is contained within the plastic tube and which carries the flavor system was identified as predominately polyethylene.

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## IV. Reports

"Gas Phase Water in Sidestream Smoke," C. N. Harward and M. E. Parrish to B. Goodman, October 28, 1985.

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Source: https://www.industrydocuments.ucsf.edu/docs/yxgm0000